



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,257	03/02/2004	Carl Stephen Arnold	2003-126-TAP	2795
7590	07/05/2005			EXAMINER BERNATZ, KEVIN M
Timothy R. Schulte Storage Technology Corporation One StorageTek Drive Louisville, CO 80028-4309			ART UNIT 1773	PAPER NUMBER

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/791,257	ARNOLD ET AL.
	Examiner Kevin M Bernatz	Art Unit 1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 20 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Examiner's Comments

1. The examiner notes that claims 11 - 18 are method claims containing only nominal method steps (i.e. "providing a", "providing at least one", "formed in", etc.). Because these claims do not represent an undo burden to examination, no restriction has been made between these claims and product claims 1 - 10. Amendment of any claims to include additional *non-nominal* method steps that would represent an undo burden may result in restriction due to original presentation.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1 - 18, drawn to magnetoresistive (MR) sensor and nominal method of making same, classified in class 428, subclass 810+.
- II. Claims 19 and 20, drawn to a method of making a MR sensor utilizing milling, classified in class 427, subclass 130.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another

Art Unit: 1773

and materially different process, such as deposition via lithography to form the depression or via chemical etching versus milling.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Timothy Shulte on March 7, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1 - 18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19 and 20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 – 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1773

Claims 1 and 11 recites the limitation "of a free layer of the magnetoresistive sensor". There is insufficient antecedent basis for this limitation in the claims since neither claim recites that one of the plurality of sensor stack layers *is* a free layer.

Claims 6 and 16 recite the limitation "a sensor stack layer adjacent one of the free layer and a pinned layer". There is insufficient antecedent basis for this limitation in the claims since the base claims do not recite either a free layer or pinned layer being present.

These rejections can be overcome by positively reciting in the base claim that the magnetoresistive sensor comprises a plurality of sensor stack layers including a free layer and a pinned layer.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 2, 6 – 12 and 16 – 18 are rejected under 35 U.S.C. 102(a) and/or (e) as being anticipated by Min et al. (U.S. Patent No. 6,606,782 B2).

Regarding claims 1 and 11, Min et al. disclose a MR sensor (*Title*) comprising a plurality of sensor stack layers (*Figure 5E*); and at least one depression (i.e. applicants' "stabilizer depression") formed in one sensor stack layer within the plurality of sensor stack layers (*Figure 5E, area marked as TW*).

The limitation "wherein the at least one stabilizer depression imparts a restorative force on a magnetic field of a free layer of the magnetoresistive sensor to align the magnetic field with a bias direction" is a functional limitation(s). As defined in the MPEP, "[a] functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)" – MPEP § 2173.05(g). However, the examiner notes that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an *inherent characteristic of the prior art*, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on" (emphasis added) - MPEP § 2183.

In the instant case, the claimed limitation(s) "wherein the at least one stabilizer depression ... with a bias direction" is a functional limitation(s) and is deemed to be an inherent characteristic of the prior art since the prior art is substantially identical in composition and/or structure. The examiner's sound basis for this assertion is the

comparison of the layer and structure order in applicants' Figures 7 and 8 to Min et al.

Figure 5E.

Regarding claims 2 and 12, Min et al. disclose a top spin valve sensor (i.e. pinned layer is on top of free layer) (*Figure 5E, layers FL and PIL*).

Regarding claims 6, 7, 16 and 17, Min et al. disclose the depression in a layer meeting applicants' claimed structural limitations (e.g. *Layer L1 and layer PM*).

Regarding claims 8 and 18, the limitation(s) "is part of a magnetic media read head" is (an) intended use limitation(s) and is not further limiting in so far as the structure of the product is concerned. Note that "in apparatus, article, and composition claims, intended use must result in a **structural difference** between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. **If the prior art structure is capable of performing the intended use, then it meets the claim.** In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." [emphasis added] *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02. In the instant case, Min et al. disclose that it is known in the art to use MR sensors as part of magnetic heads (col. 1, lines 14 – 44).

Regarding claim 9, the Examiner notes that these limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not

germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, regardless of how the depression is formed, the physical structure of the stack layers are deemed to be substantially identical.

Regarding claim 10, the Examiner deems that the claimed limitations are met for substantially identical reasons as recited above with respect to the functional limitations present in claims 1 and 11.

11. Claims 1 – 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Hasegawa et al. (U.S. Patent App. No. 2004/0067389 A1).

Regarding claims 1 and 11, Hasegawa et al. disclose a MR sensor (*Title*) comprising a plurality of sensor stack layers (*Figure 2*); and at least one depression (i.e. applicants' "stabilizer depression") formed in one sensor stack layer within the plurality of sensor stack layers (*Figure 2, area marked as C(Tw)*).

The limitation "wherein the at least one stabilizer depression imparts a restorative force on a magnetic field of a free layer of the magnetoresistive sensor to align the magnetic field with a bias direction" is a functional limitation(s). As defined in the MPEP, "[a] functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)" – MPEP §

Art Unit: 1773

2173.05(g). However, the examiner notes that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an *inherent characteristic of the prior art*, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on" (emphasis added) - MPEP § 2183.

In the instant case, the claimed limitation(s) "wherein the at least one stabilizer depression ... with a bias direction" is a functional limitation(s) and is deemed to be an inherent characteristic of the prior art since the prior art is substantially identical in composition and/or structure. The examiner's sound basis for this assertion is that the depression formed by Hasegawa et al. is specifically to influence the biasing ability of the sensor (*Paragraphs 0025 – 0033 and 0103 – 0106*).

Regarding claims 2, 3, 12 and 13, Hasegawa et al. disclose depressions formed for both "top" and "bottom" spin valve sensor structures (i.e. pinned layers (*elements 16 and 116*) are on top and bottom of free layer (*element 14*)).

Regarding claims 4 – 6 and 14 – 16, Hasegawa et al. disclose the depression in layers meeting applicants' claimed structural limitations (*element 20 for claims 4, 6, 14 and 16 and element 140 for claims 5 and 15*).

Regarding claims 7 and 17, Hasegawa et al. disclose the depression in a layer meeting applicants' claimed structural limitations (*element 116*).

Regarding claims 8 and 18, the limitation(s) "is part of a magnetic media read head" is (an) intended use limitation(s) and is not further limiting in so far as the

Art Unit: 1773

structure of the product is concerned. Note that "in apparatus, article, and composition claims, intended use must result in a ***structural difference*** between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. ***If the prior art structure is capable of performing the intended use, then it meets the claim.*** In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." [emphasis added] *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02. In the instant case, Hasegawa et al. disclose that it is known in the art to use MR sensors as part of magnetic heads (*Examples and Figures 20 and 21*).

Regarding claim 9, the Examiner notes that these limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, regardless of how the depression is formed, the physical structure of the stack layers are deemed to be substantially identical.

Regarding claim 10, the Examiner deems that the claimed limitations are met for substantially identical reasons as recited above with respect to the functional limitations present in claims 1 and 11.

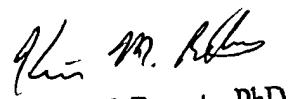
Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
June 25, 2005


Kevin M. Bernatz, PhD
Primary Examiner